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REPORT

OF THE

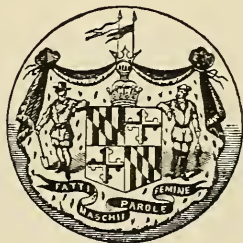
COMMISSIONERS OF FISHERIES

OF

MARYLAND.

G. W. DELAWDER, S. P. TOADVINE,

Commissioners.



ANNAPOLIS :

GEORGE T. MELVIN, STATE PRINTER.

1899.



REPORT.

To his Excellency, ELIHU E. JACKSON,

Governor of Maryland:

In accordance with the requirements of the Act creating the Commissioners of Fisheries of Maryland, we have the honor to transmit to your Excellency, the following report of our operations, for the year ending December the 31st, 1889.

During this year we have visited most of the rivers and creeks of the State, and have distributed the young fry hatched by us, in those, that we deemed most suitable for the same, as will be shown by tabulated statement further on.

We also visited the different fisheries, so as to obtain statistics and other information as to the catch for the last year, means employed to take same, and the value thereof.

Following in the footsteps of our predecessors, which experience and results show to have been the right course, we have engaged principally in the propagation of shad, herring, rock and perch of various kinds.

Having now five hatching stations, viz: One at Druid Hill Park, Baltimore, and one at Havre-de-Grace, one on Tuckahoe river near Coward's Point, Caroline county, known as the Choptank Station, one at Twiford Mills, near Sharptown, Wicomico county, and a short distance from the Nanticoke river, known as the Nanticoke station, and one in the headwaters of the Wicomico river, at Salisbury. All of these stations or hatcheries are equipped with the system and improvements for hatching, which experience and recent discoveries in the science of pisciculture have demonstrated to be the best and most successful.

The employees engaged in the taking and hatching of roe, many of whom have been employed for some time, have become very proficient, so that we obtain better results than formerly.

The Choptank station, from which we supply the waters of the upper portion of the Eastern Shore with the young fry of shad, herring, rock and perch, is a substantial building of wood, built on piles over the edge of the river and is under the control and management of Thomas Hughlett, Jr., Esq., who has a force of four subordinates to assist him.

Mr. Hughlett, who has been connected with the Fish Commission of Maryland from its start, is an efficient and practical man, and takes great interest in his work, and was very successful in the hatch of shad, &c., this season, as will be seen by the tabulated report of work accomplished at this station.

The Nanticoke station from which we use the hatch of shad, herring, rock and perch to stock the Nanticoke river, and the waters of Dorchester, and other adjacent counties, is built just below Twiford's Mill, and the water used for hatching purposes is carried from the pond to the hatching house by means of pipes, and is very pure and clear and suitable for the purposes of the hatchery. This station is about the central point of the fresh water fishing grounds on the Nanticoke. Between Vienna and Seaford, Del., on said river, and the mouth of Marsh Hope river and Federalsburgh, fishing is carried on extensively. The means of taking fish principally used are haul and float seines, and pound nets. From and up the Marsh Hope river to the spawning grounds on the Nanticoke, is a distance of about forty miles. To enable us to utilize this large area to the best advantage, we have a steam launch which is used by the employees at this station to collect the spawn, and convey it to the Nanticoke station, and to transport the young fish, when hatched, to various points within these limits, for planting.

We have been very successful in our operations at this station this year, as will be seen by tabulated statement of fish hatched at and deposited in Maryland waters from this station.

Walter C. Mann, Esq., the Superintendent of this station, and his force of six men have worked hard, and to their zeal and intelligent efforts, must in a great part be attributed the large hatch of this year.

The Wicomico station is used principally to stock the waters of the lower part of the Eastern Shore with shad, herring and perch—it is constructed on the site of an old saw mill, and supplied with water for hatching purposes, from the Locust Grove mill pond, belonging to the Hon. Thomas Humphreys, who has discontinued the use of same for sawing purposes, and uses the whole power for carrying on a large flour mill. The spawn used at this station are gathered on the Wicomico river, from Shad point to the Upper Ferry principally.

This Station is under the superintendency of Sylvanus Trader, Esq., who with his force of six assistants, have pushed on the work with great skill and energy.

We use pails at all the stations for carrying shad eggs from the points where they are gathered and impregnated to the stations, experience having taught us that this is all that is necessary, where the spawn is taken at points near the station, as is done on the Eastern Shore.

Our work has been gradually increasing from year to year, and we are confident that it will continue to do so. As is shown by the fact that we have hatched out at the different stations and deposited in Maryland waters, more shad than in any year since the Commission has been in operation. Over forty millions (40,000,000) young shad have been hatched this year, and distributed in the waters of Maryland, as shown by the tabulated

report in another portion of this book. The reason of the large increase in number of fish hatched, is found in the increased catch of shad this year over preceding ones.

The increase in the catch is shown by reference to the shad fisheries of the Potomac river, that prior to the year 1880, had become of very little profit to their owners, and of very little worth. But since that time, there has been a gradual increase, until in the nine years it has reached the enormous sum of six hundred and ten thousand dollars, (\$610,000.) This we think is the direct result of placing yearly, millions of young shad in the Potomac river and the upper waters of the Chesapeake bay.

We have also devoted considerable time to the distribution of German carp, placing them in our rivers in large quantities and filling all orders for same from persons in the State, desiring them to place in their ponds. These fish are new to our fisherman, and very few have been caught in our waters until the present year, except in ponds, specially devoted to their culture, but when caught, find ready sale at good prices in our markets. This year they have been caught in considerable numbers at the head of the bay, and in the Choptank, Tred Avon and other rivers, as many as ninety-seven having been caught at one haul at the head of the bay, weighing 528 lbs. We have no doubt that these fish will continue to increase and soon become a staple article of food in our market.

That the Commission is productive of good, and the cause of the increase in the catch of shad is well shown, by a fact to which our attention was called this year. Three years ago Dr. E. W. Humphreys who was then Commissioner for the Eastern Shore, caused to be placed in the St. Martin's river, which empties into the Isle of Wight bay, about one hundred miles from the mouth of the Synepuxent bay, about three hundred thousand shad. In this river which is famous for its herring fisheries, no shad have been caught in the memory of man until this season, when they were caught in considerable quantities. This is in accordance with the theory of the best fish culturists that shad will commence to return to the waters in which the young are deposited in three years, and we feel no doubt that the catch of shad in this river will increase annually, as in other places where they have been placed by the Commission. This seems to us to be one of the strongest evidences of the value of pisciculture, and we have not the least doubt, that the large increase in the shad catch is the result of the placing in our waters of the millions of young shad by Commission, and feel confident that if the same is maintained, that the luscious shad, instead of being a luxury in the reach of the rich alone, will come down in price so that every laboring man can afford to use them daily for food. And if our present success in hatching continues, of which we have no doubt, in less than five years the best roe shad will sell in our markets for as little as one dollar per dozen.

In visiting the different rivers and creeks of the State, to place in them young fish, suitable for growing in them, and in visiting the principal fisheries of the State, we have collected such statistics as we could, and find that the increase in catch of shad and other fish has caused a corresponding increase in capital and labor employed, and in number of traps and other devices used in fishing, as will be seen by reference to tabular statement. The fisheries on the Eastern Shore have increased very largely, and the catch of shad, herring, rock and perch have grown correspondingly. But we think, with proper exertion in the culture of said fish, the catch will increase yearly hereafter, notwithstanding so many fish are turned away or destroyed by pound nets.

Reports received from persons engaged in fishing for shad in the different rivers of the State, show that there has been an increase yearly in the number of shad caught for about eight years, and that the catch in the seasons of 1888 and '89, exceed those of any previous years for at least twenty-five, very largely.

On the Choptank and Tuckahoe rivers, the catch this year was very large and the money received by the fishermen caused a boom which was felt and appreciated by all the community.

At the head of the bay and on the Susquehanna river, often the fishermen were unable to haul their seines ashore on account of being so full of fish, and had to open their seines and allow a part to escape before they were able to land them. These facts are easily proven, and should convince any one who is not filled with prejudice that pisciculture in this State, at least, is a success, and that the end attained and the large increase in the catch of said fish is due in a great part to the energy and efficient management of the Fish Commissioners and their employees. We have tried to get reliable information from all the rivers of Maryland, as to the number of traps and seines used in each river in the taking of fish, the value thereof, the number of men employed, and the quantity and value of fish caught in same. We have succeeded in getting these statistics from many of the rivers correctly; that of the North East river being only twelve miles in length, we will take as a basis, to estimate the value of materials, and number of men employed in taking of fish and the value of the catch.

On this river we find five haul seines valued at fifteen thousand dollars, using five pungies and twenty-five small boats, valued at ten thousand dollars, and giving employment to at least two hundred men; also thirty-three pound nets, valued at ten thousand dollars, employing boats in carrying on the work, valued at seven thousand dollars, and employing one hundred and twenty-five men; in addition to these, seventy boats and one hundred and fifty men are engaged in catching fish by floating; these seines and boats are worth about seven thousand dollars.

The catch of shad and herring in these are as follows: haul seines, 60,000 shad, 3,000 barrels of herring; pound nets, 30,000

shad, 2,000 barrels of herring; float and gill seines, 200,000 shad. This makes a total catch of 290,000 shad, worth at the average price of thirteen cents apiece, thirty-seven thousand seven hundred dollars; and of five thousand barrel of herring worth at least fifteen thousand dollars; a total of fifty-two thousand seven hundred dollars. This does not include the winter, spring and fall catch of fish, rock and perch, principally, which we think is worth at least one-fourth as much as the catch of shad and herring. This makes total value of catch in this river \$65,875.00. Number of men employed 475, and the value of seines and traps and boats in business, \$42,000.

Comparing the size of the North East river with that of the other waters of Maryland, we feel justified in assuming that the catch of fish in Maryland waters, is at least fifty times as large as that in the North East river. If this supposition is correct then capital to the amount of two millions one hundred thousand dollars, and men to the number of twenty three thousand seven hundred and fifty are engaged in catching food fish in Maryland waters, and the annual catch amounts in value to three millions two hundred and ninety three thousand seven hundred and fifty dollars. Is this interest worth protecting? Twelve or fifteen years ago the catch of shad and herring declined so, that, many of our most valuable fishing grounds had to be abandoned, and fears were aroused that, in the near future, that prince of fish, the shad, would become such a rarity that only millionaires could afford to eat them. In answer to the question as to what should be done in the matter, the Legislature of 1874, passed the Act establishing the Fish Commissioners of Maryland. The men appointed under this Act by the Governor went faithfully to work, turning their attention principally to the hatching of shad, millions of which they and their successors have hatched and put in Maryland waters. The fight was uphill for many years, no great increase in the catch of shad being apparent until some five years ago, when the catch commenced improving, and has continued to do so up to the present. In proof of this we submit herewith a few letters from prominent fishermen in this State, most of whom are unknown to us.

That this increase can be maintained in view of the increased numbers of traps and improved devices for catching fish in use at present, we very much doubt, unless the efforts of the Fish Commissioners be supplemented by further legislation.

We suggest that all catching of shad and herring should be prohibited after 1st of June in each year. That all seines and other devices should be removed from the waters from 6 p. m., Saturday to 6 a. m. Monday during shad and herring season. This would enable many shad to reach the spawning grounds at the head of the rivers that are now caught and destroyed or turned back by the obstructions they meet.

We would also suggest that all fishing with seines or nets or any

device made out of twine with a mesh of less than $1\frac{1}{4}$ inch square or $2\frac{1}{2}$ inch when extended, be prohibited.

Also that the size of fish to be sold in our markets should be regulated by law.

We would call, specially, attention to the work done in stocking the streams of Maryland, suitable for that purpose, with trout of various kinds and other game fish, viz:

RAINBOW TROUT.

The well known adaptability of the waters of our mountain streams in Western Maryland, induced an experiment with the celebrated California Rainbow Trout. In 1885 some six thousand eggs were obtained from the U. S. Fish Commissioners, which were hatched and distributed in the Youghogany river and Lake Cleveland, in Garrett county. The success of this experiment has been beyond the most sanguine hopes of your Commissioners as demonstrated by the catch of these fish in the last two years. In 1888 (three years after their first introduction,) trout were taken measuring sixteen inches in length, and during the past season of 1889, they have been caught measuring twenty-two inches and weighing three and a half pounds. What size they may ultimately attain is a problem to be solved, but of one point we feel convinced, their capture will tax the dexterity of our most experienced and ardent sportsmen. The trial on this small scale, justifies the conclusion that we have in our State, waters thoroughly calculated for the propagation of these very desirable fish, and these waters are not confined to those above named, for in our opinion, the Monocacy, the head waters of the Patuxent and the Patapsco, would be adapted for the same fish.

Encouraged as have been your Commissioners in this line of experiment, it is proposed to carry the trial still further, and introduce this fish into other streams deemed suitable to their growth and increase.

In New York and other Northern States, successful efforts have been made with these California Trout, but we fail to record anything as encouraging as the experiments of the last four years have given in the waters of Western Maryland. Indeed it is questionable, whether in their native streams in California, anything more desirable would have been obtained, than has clearly been demonstrated by your Commissioners in their initial trial.

BROOK TROUT.

For this well known and deservedly popular fish, ample opportunity exists to make our streams as populous as they were in the early settlement of our country.

Wanton destruction and no law to protect has destroyed the Brook Trout in many streams in Maryland where they were once very abundant, and in these same streams they can be reproduced again. It would be an easy task to repopulate our streams with not only trout but other fish that have either entirely dis-

appeared or been greatly reduced in numbers, if the importance of protecting the young fish could be impressed upon the minds of the general public. If it is supposed that fish placed in a stream one year can be taken in unlimited numbers the next, and by all devices imaginable, no efforts, however well directed, can ever be expected to succeed. Stringent laws looking to the protection and encouragement of fish culture, should be honestly enforced. Much could be accomplished by liberal aid from the State in the way of appropriations for this purpose. The efforts of your Commissioners have been very much embarrassed by the large amount deducted from the appropriation for the destruction of eels.

In view of what has been done in the past, and the field which is open in the future, it is to be hoped that the appropriation will be restored to its legitimate purpose.

The introduction of Bass into the Potomac river by Mr. Shriver, and their wonderful increase, is a matter so well authenticated, and so thoroughly discussed by those interested in the subject of fish culture, that nothing additional need be said upon it at this time, but we would call attention to probable dangers, which may lead to the entire destruction of these very valuable fish, in this, the largest tributary in our State to the Chesapeake Bay.

That at certain points on the Potomac where Black Bass were formerly very plentiful, it is to-day uncertain whether one could be caught in a day's fishing, leads to the inquiry, what is the cause?

We would suggest an inquiry into the effect upon the waters of the drainage from so many tanneries and pulp mills situated immediately upon this important stream.

How far thus multiplying these industries, and increasing the flow of refuse material into the said waters may affect the fish, requires closer investigation than your Commissioners have as yet been enabled to give the subject, but no other plausible theory existing to account for the diminution of the fish at points alluded to, and as this diminution has followed the establishment of increased tanneries and pulp mills, your Commissioners feel convinced that the cause can be traced to no other source.

Does this drainage material produce directly an injurious effect upon the fish, or does it destroy the food necessary for the fish life the waters are capable of sustaining? If injurious as above indicated, what means can be resorted to looking to a correction of the evil?

Fish being regarded as scavengers of natural impurities in all waters, are they capable of removing artificial impurities, particularly when introduced in such large quantities as is furnished by the industries alluded to above?

A series of experiments would very readily solve these questions, and preserve to the State of Maryland and the inhabitants of the

City of Washington, this very valuable fish, which should be a food supply from the sources of the Potomac, in West Virginia and our own State, to the waters of the Bay into which it empties. All disciples of Sir Isaac Walton, will feel deeply interested in this subject, and considering the accessibility of these waters to the cities of Baltimore, Washington and Philadelphia, we unhesitatingly pronounce it, the finest natural waters for the Black Bass, east of the Alleghanies.

Inquiry should be directed, not only to the injurious effect upon the fish in this stream, but as to its effect upon the health of the inhabitants in the two cities drawing their principal supply of water from this stream. Cumberland and the City of Washington, are vitally interested in the question of keeping pure the waters of the Potomac. To the residents of the large and rapidly growing capital of our nation, this subject seriously addresses itself, and we feel convinced that the time is at hand when a careful investigation of these questions will be made, and perhaps a remedy devised by the law-making powers of our State and nation.

G. W. DELAWDER,
S. P. TOADVINE.

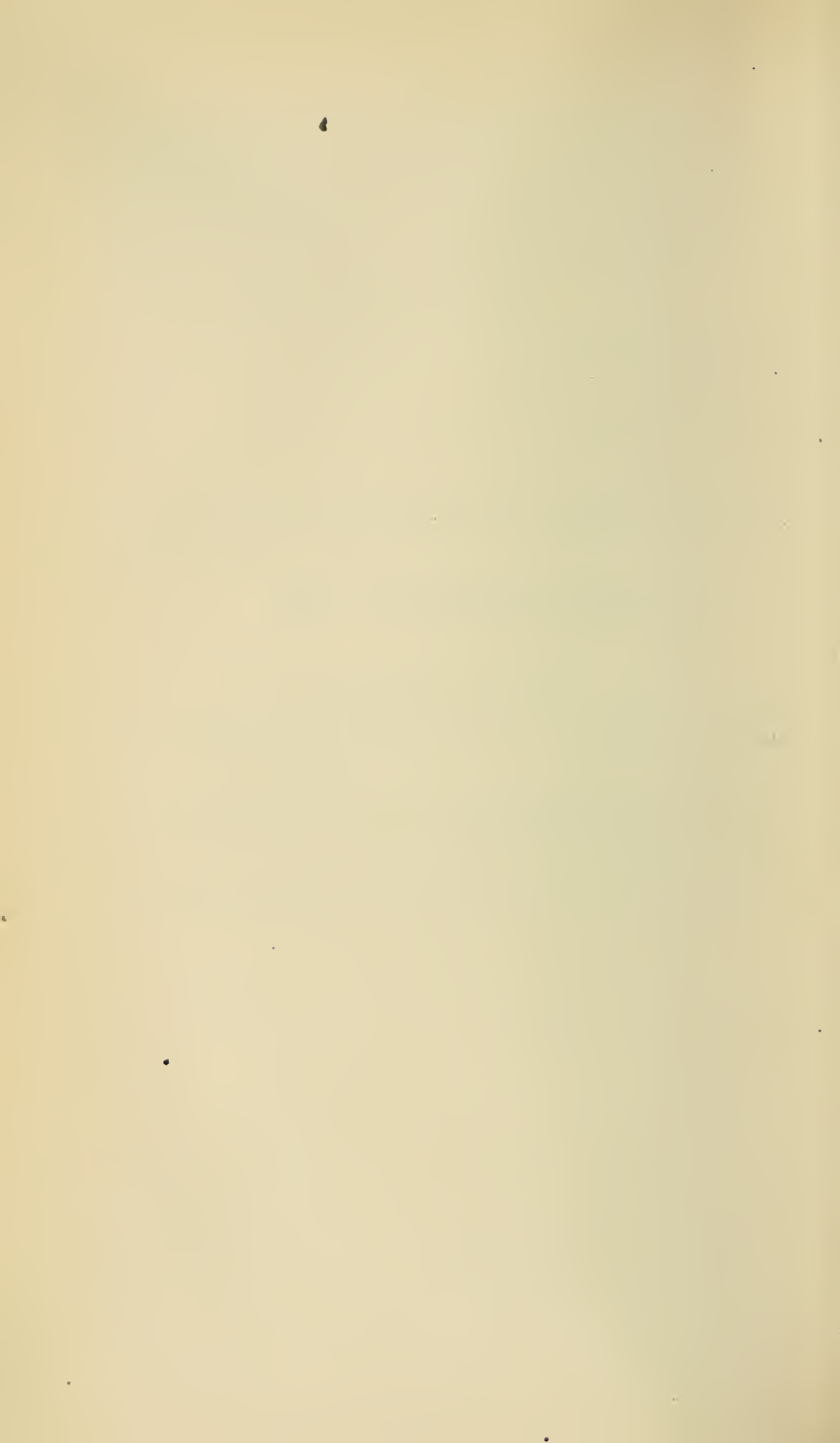
EELS.

A large proportion of the appropriation for the use of the Fish Commission, which has in former years been used in the propagation of fish, having been set aside for the destruction of eels, by Act of Assembly, passed in 1888, we have been unable to do as much in the hatching of rock and perches—our stand-bys for all seasons as we would have liked to do—believing as we did, that it was best to devote the time of ourselves and employees to the propagation of shad, in the catching of which so many persons are employed, and on which many are dependent for a living.

APPENDIX.

(Referred to in Report.)

Showing in Detail the Dole of Fish Taken, Eggs Fertilized, Fry
Hatched, Where Deposited, &c., at the Different Stations.



To the Honorable, the General Assembly of Maryland :

In accordance with the provisions of chapter 497, of the Act of 1888, we herewith submit a report of our proceedings thereunder, as required by said law, one-fourth of the Fish Commission received by us in the years 1888 and 1889 was set apart for the destruction of eels.

The amount set apart for this purpose in 1888 was.....	\$1,250 00
“ “ “ “ “ “ 1889 “	2,500 00
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	\$3,750 00
We received from sale of eels in 1888	\$16 00
“ “ “ “ “ “ 1889	100 69
	<hr/>
	116 69
	<hr/>
	\$3,866 69
Number of eels caught and destroyed in 1888.....	17,858
“ “ “ “ “ “ 1889.....	68,732
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Total	86,590
Expenses in catching, destroying and marketing eels in 1888.....	\$697 18
Expenses in catching, destroying and marketing eels in 1889.....	2,833 61
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	\$3,530 79
	<hr/>
Balance due eel fund.....	\$335 90
This above balance used in hatching and propagating shad and credited to the fund for that purpose	\$335 90
We think the old time oak split eel-pot baited with fresh offal of any kind the best way to catch eels, and we recommend the use of the same.	

S. P. TOADVINE,
G. W. DELAWDER.

An approximated estimate of the number of shad caught during the Spring of 1889, in the following waters :

Potomac River and Sound.....	30,000
100 Scope nets.....	4,500
20 Float seines.....	11,230
55 Fikes.....	35,000
10 Pounds.....	3,500

Tangier Sound at Mouth of Little Annemessex River.

5 Pounds.....	1,500
20 Fikes.....	1,200

Manokin Run.

50 Fikes.....	1,565
2 Pounds.....	1,235

Fishing Bay, Black Water and Transquakin.

150 Gill nets.....	10,500
50 Fikes.....	5,250
5 Pounds	2,560
Tread Aven.....	8,000
8 Pounds.....	10,000
20 Gill bobs.....	4,000
10 Fikes.....	

Chester River

15 Pounds.....	7,500
50 Gill boats.....	10,300
40 Fikes.....	500
50 Stick nets.....	450
3 Hole Seines.....	2,500

Sassafrass River.

20 Small pounds.....	2,500
20 Fikes.....	5,560

Elk and Bohemian Rivers.

25 Pound nets.....	3,000
20 Gills.....	8,350
10 Fikes.....	1,500

Upper Bay between Havre-de-Grace and Pool's Island.

6 Hole seines.....	220,500
600 Float seines....	350,150
2 Large fikes.....	260,850

DISTRIBUTION BROOK TROUT.

Robt. A. Thursty	500
T. B. Ferguson	500
John R. Cox	500
Charles S. Lee	500
Miss Mollie Bowling	5,000
Michael Jenkins	100
Richard F. Kimball	500
S. N. Hyde	1,000
John F. Gardner	1,000
Wm. Lamdin	5,000
In waters of Baltimore county near Reisterstown	16,000
Howard county	16,000
Prince George county	600
Harford county, care of Hon. H. Stump	20,000
John T. Hennamon, for distribution in Baltimore county	15,000
Edward S. Price, Baltimore county	15,000
Carroll county	16,000
	<hr/>
	113,200
Powings German Carp	100
I. T. Getz, German Carp	50
Capt. Cassell, "	50
L. A. Page, "	50
L. O'Donovan, "	50
Elijah Loar, "	100
Stephen Frock, "	100
Capt. Thirman, "	100
Herman Hanson, "	100
S. H. Hopkins, "	600
Peter Loar, "	300
Christian Seabaugh, "	200
George W. Leonard, "	75
— Williams, "	50
Lambert Cooper	50
Wm. H. Beach	50
Hon. E. Stanley Toadvin	75
Hon. Thos. Humphreys	75
Judge Chas. F. Holland	75
Henry W. Anderson	75
Richard Morgan	50
W. H. Hope, Supt. C. Home, Pikesville	1,000
Jesse Moore, Supt. House of Correction	1,000
S. F. Toadvine, pond	75
Geo. Baurusnuch	150
Gen. J. B. Seth	100
W. Fletcher, pond, Quantico, Md.	75
Wm. S. Parsons	50
T. B. Barnett, Somerset county	50
James Bounds, Somerset county	50
John Griffith, Somerset county	50
Wm. J. Anderson	75
Miles river	1,000
Choptank river	500
Wicomico river	300
Tred Avon river	500

TABLE I.—RECORD OF SHAD HATCHING OPERATION AT SALISBURY STATION, WICOMICO, FROM APRIL 13TH, 1889, TO MAY 23RD, 1889.

Date.	No. Shad Taken.	No. of Eggs Obtained	Date of Hatching.	Where Deposited.	No. Fry Deposited.
1889. April 13.....	1	25,000	April 22.....	Wicomico river.....	25,000
" 19.....	2	50,000	" 26.....	" ".....	50,000
" 23.....	8	200,000	May ".....	" ".....	200,000
" 25.....	10	250,000	" 3.....	" ".....	250,000
" 26.....	16	400,000	" 4.....	Manokin river.....	400,000
" 27.....	5	125,000	" 5.....	" ".....	125,000
" 30.....	5	125,000	" 7.....	Wicomico river.....	125,000
May 1.....	6	150,000	" 8.....	" ".....	150,000
" 2.....	4	100,000	" 10.....	" ".....	100,000
" 3.....	5	125,000	" 11.....	" ".....	125,000
" 4.....	2	50,000	" 12.....	" ".....	50,000
" 7.....	30	750,000	" 13.....	Pocomoke river.....	750,000
" 8.....	22	550,000	" 14.....	Snow Hill P. R.....	550,000
" 9.....	16	400,000	" 15.....	" ".....	400,000
" 10.....	10	250,000	" 16.....	Wicomico run.....	250,000
" 11.....	1	25,000	" 17.....	Wicomico river.....	25,000
" 14.....	5	125,000	" 18.....	" ".....	125,000
" 16.....	10	250,000	" 19.....	" ".....	250,000
" 17.....	5	125,000	" 21.....	" ".....	125,000
" 18.....	1	25,000	" 23.....	" ".....	25,000
" 21.....	5	125,000	" 24.....	" ".....	125,000
" 22.....	4	200,000	" 25.....	" ".....	100,000
" 23.....	2	50,000	" 27.....	" ".....	50,000

TABLE II—RECORD OF SHAD HATCHING OPERATION AT NANTICOKE STATION, FROM APRIL 22ND, 1889, TO MAY 20TH, 1889.

Date.	No. Shad Taken.	Eggs Obtained.	Date of Hatching.	Where Deposited.	No. Fry Deposited.
1889. April 22.....	15	375,000	April 28.....	Nanticoke river....	325,000
" 23.....	12	300,000	" 30.....	" "	300,000
" 24.....	16	400,000	May 1.....	" "	500,000
" 25.....	21	525,000	" 2.....	North East river....	1,000,000
" 26.....	18	450,000	" 3.....	Nanticoke river....	400,000
" 30.....	22	550,000	" 6.....	" "	525,000
May 1.....	4	100,000	" 6.....	Laurel, Del.....	125,000
" 2.....	16	400,000	" 7.....	" "	350,000
" 3.....	30	750,000	" 8.....	Nanticoke river....	650,000
" 6.....	26	700,000	" 10.....	" "	550,000
" 7.....	24	600,000	" 11.....	" "	525,000
" 8.....	44	1,100,000	" 12.....	Marsh Hope.....	1,000,000
" 9.....	20	700,000	" 13.....	" "	500,000
" 10.....	28	850,000	" 14.....	Nanticoke river....	350,000
" 13.....	16	450,000	" 17.....	" "	325,000
" 14.....	17	500,000	" 18.....	" "	800,000
" 15.....	32	850,000	" 19.....	Scofield, Del.....	875,000
" 16.....	7	200,000	" 20.....	" "
" 17.....	4	100,000	" 21.....	" "	200,000

Herring hatched and deposited in the Nanticoke river.

TABLE III.—RECORD OF SHAD HATCHING OPERATION AT NANTICOKE STATION, CAROLINE Co., MD., APRIL 15, 1889, TO MAY 20, 1889.

Date.	No. Shad Taken.	No. Eggs Obtained.	Date of Hatching.	Where Deposited.	No. Fry Deposited.
1889, April 15.....	3	75,000	April 22.....	Tuckahoe river.	2,000,000
" 17.....	2	50,000	" 23.....	" "	500,000
" 18.....	6	150,000	" 25.....	" "	800,000
" 19.....	9	225,000	" 26.....	" "	100,000
" 20.....	20	500,000	" 27.....	Greensborough.	700,000
" 22.....	41	2,025,000	" 28.....	Blackwater.	400,000
" 23.....	36	300,000	" 29.....	Tuckahoe river.	500,000
" 24.....	13	325,000	" 30.....	Pocomoke river.	700,000
" 25.....	14	450,000	May 1.....		
" 26.....	3	75,000	" 3.....	Choptank.	1,500,000
" 27.....	4	100,000	" 7.....	" "	800,000
" 29.....	11	275,000	" 10.....	North East.	2,000,000
" 30.....	18	450,000	" 12.....		
May 1.....	19	475,000	" 15.....	Choptank.	600,000
" 2.....	23	875,000	" 17.....	Centerville.	700,000
" 3.....	17	425,000	" 18.....	Bohemia river.	500,000
" 4.....	19	475,000	" 19.....	Sassafras river.	500,000
" 6.....	51	1,275,000	" 20.....	Snow Hill.	1 000,000
" 7.....	21	825,000	" 21.....		
" 8.....	19	475,000	" 21.....	Chickahomina.	400,000
" 9.....	18	450,000	" 21.....	Tuckahoe river.	300,000
" 10.....	8	200,000	" 21.....	" "	200,000
" 11.....	2	50,000	" 21.....	" "	
" 13.....	11	275,000	" 21.....	" "	
" 15.....	12	300,000	" 21.....	" "	
" 16.....	4	100,000	" 21.....	" "	1,000,000
	404				

TABLE IV—RECORD OF SHAD HATCHING OPERATION AT DRUID HILL, FROM ——— 25TH, 1889, TO JUNE 6TH, 1889.

Date.	No. Shad Taken.	Eggs Obtained.	Date of Hatching.	Where Deposited.	No. Fry Deposited.
1889. April 26.....	12	300,000	May 4.....	Patapsco	250,000
" 30.....	12	300,000	" 7.....	" river....	250,000
May 2.....	25	600,000	" 9.....	" "	500,000
" 6.....	28	700,000	" 11.....	" "	500,000
" 8.....	55	2,000,000	" 13.....	" "	1,500,000
" 9.....	56	2,000,000	" 14.....	" "	1,800,000
" 10.....	70	2,800,000	" 16.....	" "	2,500,000
" 11.....	65	2,500,000	" 17.....	" "	2,100,000
" 15.....	33	1,200,000	" 20.....	" "	1,100,000
" 17.....	65	2,500,000	" 22.....	" "	2,100,000
" 18.....	28	800,000	" 22.....	Severn	700,000
" 19.....	60	2,200,000	" 23.....	Back	2,100,000
" 20.....	6	200,000	" 25.....	Severn	200,000
" 20.....	20	800,000	" 25.....	Back	600,000
" 27.....	14	650,000	June 4.....	Patapsco	500,000
" 28.....	10	400,000	" 5.....	Patuxent	400,000
" 30.....	20	800,000	" 6.....	do.	700,000

TABLE V.—RECORD OF SHAD HATCHING AT HAVRE-DE-GRACE STATION, FROM APRIL 25TH, 1889, TO JUNE 5TH, 1889.

Date.	No. Shad Taken.	Eggs Obtained.	Date of Hatching.	Where Deposited.	No. Fry Deposited.
1889. April 25.....	12	325,000	May 3.....	Susquehanna	300,000
" 30.....	28	800,000	" 4.....	"	700,000
May 1.....	14	350,000	" 5.....	"	350,000
" 2.....	36	1,000,000	" 7.....	"	900,000
" 3.....	15	500,000	" 11.....	"	350,000
" 7.....	25	900,000	" 13.....	"	460,000
" 9.....	30	1,200,000	" 15.....	"	740,000
" 14.....	8	300,000	" 18.....	"	250,000
" 15.....	12	400,000	" 21.....	"	350,000
" 18.....	15	500,000	" 24.....	"	460,000
" 21.....	18	600,000	" 27.....	"	550,000
" 23.....	10	300,000	" 29.....	"	310,000
" 26.....	8	725,000	June 2.....	"	190,000
" 28.....	5	150,000	" 4.....	"	150,000

REPORT OF THE CATCH OF SHAD AND HERRING ON THE NORTH EAST RIVER FOR 1889.

No. and Kinds of Seines.	Value of Seines.	No. of Boats.	Value of Boats.	No. Men Empl'd	Shad Taken	Value Thereof.
5 Hauling seines	\$15,000 00	30	\$10,000 00	200	60,000	\$37,700 00
33 Pounds	10,500 00	38	7,000 00	125	30,000	15,000 00
70 Gill pots and seines.	7,000 00	200	7,000 00	150	200,000	13 175 00
Herring, 5,000 barrels.	Other Fish—Rock, Perch, Catfish, &c., at 4				200,000	\$65,875

REPORT OF THE CATCH OF SHAD AND HERRING ON TUCKAHOE RIVER FOR 1889.

No. and kinds of seines	Value of Seines.	No. of Boats.	Value of Boats.	No of Men Empl'd.	Shad Taken.
40 Gill nets	\$1,000 00	40	\$800 00	80	50,000
5 Hall seines	1,000 00	5	500 00	50	60,000
Herring estimated.	Other fish not included in this Report.				

REPORT OF THE CATCH OF SHAD AND HERRING ON THE CHOPTANK FOR 1889.

No. and kinds of seines	Value of Seines.	No. of Boats.	Value of Boats.	No. of Men Empl'd.	Shad Taken.
320 Float seines.....	\$8,000	165	\$4,500	320	195,000
60 Haul seines.....	12,000	70	2,500	350	240,000
300 Pounds.....	30,000	165	8,300	350	30,000
200 Fike nets.....	6,000	50	1,000	100	20,000
200 Stake nets, large.	22,000	75	1,500	50	15,000
1500 Stake nets, small.	10,000	100	2,000	100

Herring and other fish.

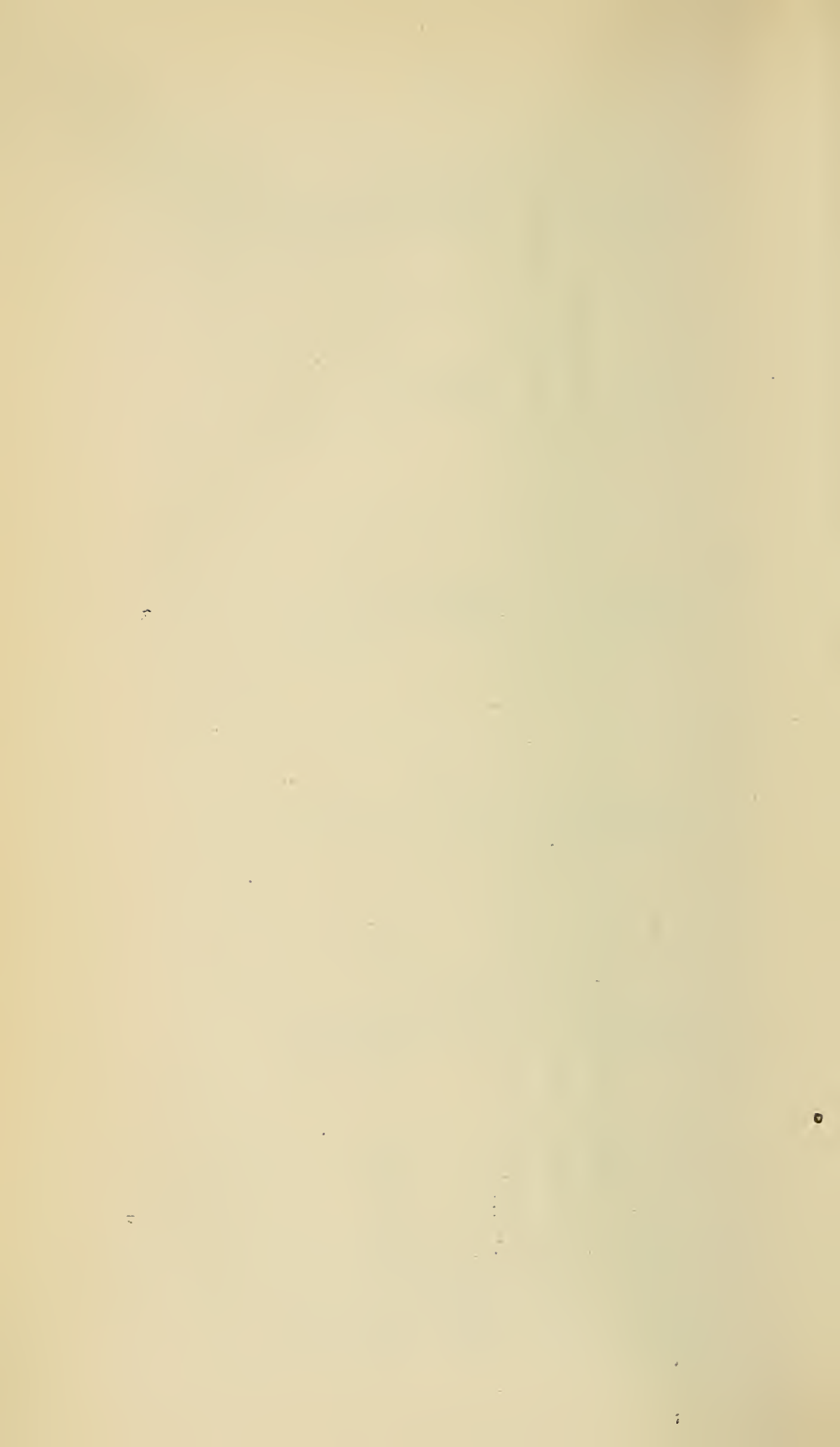
REPORT OF THE CATCH OF SHAD AND HERRING ON NANTICOKE RIVER AND TRIBUTARIES FOR 1889.

No. and kind of sein. s.	Value of Seines.	No. of Boats.	Value of Boats.	No. of Men Empl'd.	Shad Taken.
50 Pound nets.....	\$5,000	50	\$1,000	150	75,000
15 Haul seines.....	4,500	15	4,500	75	90,000
190 Gill nets.....	3,800	190	3,000	380	132,000
175 Fike nets.....	2,000	150	1,000	150	130,000
410 Stick nets.....	2,000	105	4,000	100	30,000

Herring caught. Other fish such as Rock, Perch and Cat fish not included.

REPORT OF THE CATCH OF SHAD AND HERRING ON WICOMICO RIVER AND TRIBUTARIES FOR 1889.

No. and kinds of seines	Value of Seines.	No. of Boats.	Value of Boats.	No. of Men Empl'd.	Shad Taken.
65 Float Seines	6,500	250	\$1,250	250	36,000
600 Stick nets.....	6,000	250	1,500	250	30,000
100 Filkes.....	5,000	50	500	50	50,000
5 Hall Seines.....	1,000	5	250	50	15,000
6 Pounds.....	2,000	26	500	25	10,000
Herring caught. Other fish, such as Rock, Porch and Cat fish not included.					



APPENDIX NO. 2.

Showing a List of Letters from some of the Leading Fishermen of
the Eastern Shore of Maryland.

VIENNA, MARYLAND, November 19th, 1889.

To the Fish Commissioners of Maryland,

GENTLEMEN:—I have had a fishery in the Nanticoke river near this place for several years, and have had an opportunity to observe fish caught by other people. I have noticed for the last three or four years a marked increase in the size and quantity of fish—shad and herring in particular. This year fish were more abundant than for many years past.

I am decidedly of the opinion that the improvement in both the quantity and quality of fish is attributable to the skillful and energetic operations of the Fish Commissioners in our river. I sincerely hope that the State will continue a work that is evidently of so much advantage to one of her interests.

Yours very truly,

MAJOR B. MARSHALL,

NORTH EAST, November 23rd, 1889.

To the Fish Commissioners of Maryland,

GENTLEMEN:—I have been engaged in fishing a hauling seine on the North East river for forty years; there is no doubt but what there has been a vast increase of shad and herring in our river for the last five years. On the account of population—there must be a greater demand for shad, the supply has been about equal to the demand at reasonable prices, and when I come to look at the increased number of men employed and improved traps set all along the Chesapeake bay, from its mouth to the head of tide water, I cannot help but say that there are more fish and shad caught now than for several years. As German carp and other strange fish are appearing in our river in large numbers this is the work, no doubt, of the Fish Commissioners, and the large quantity of young fish let go by the Maryland Fish Commissioners assist greatly in increasing the number of fish and is doing a great work.

JAMES CROTHERS.

VIENNA, MARYLAND, November 19th, 1889.

To the Fish Commissioners of Maryland,

GENTLEMEN:—I have been engaged in fishing and dealing in fish at this place for fifteen years, and for the last three years there has been a steady increase in number and size of fish, shad and herring in particular; and this year the fishing was the best of all. And I must say that I attribute the increase to the energy of the Maryland Fish Commissioners, who have hatched and placed large number of fish in our river. I hope the State will continue the Commission, as it is a great benefit to our fishing.

Yours truly,

W. F. VENABLES.

NORTH EAST, November 26th, 1889.

To the State Fish Commissioners,

GENTS:—I have been engaged in fishing and hauling seines on the North East river for thirty five years. I was prejudiced against fish hatching when it first commenced, and for several years; after looking over the situation and studying the matter over, and large numbers of strange fish appearing in our river which must be the work of the Fish Commission, and the increase of shad in the last four or five years, I cannot help from saying that in my opinion the Fish Commission is doing good work, and the shad that they hatch and turn out in our waters adds to the natural increase, otherwise they would be a total loss.

MATHIEW RUSSELL.

MALONE'S LANDING,

WICOMICO RIVER, May 28th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

DEAR SIR:—Being an old resident and a fisherman on the Wicomico river for over thirty years, I have watched with great interest the fish in our river. Twenty years ago the shad and herring were plentiful in our river, but for some reason they have dwindled down to almost nothing until two or three years ago, when they commenced to increase in number and size. Last year we had the finest shad that I ever saw caught on this river. I attribute it to fish hatching, and I hope you will continue to hatch fish until our river is well stocked up.

Yours truly,

L. W. MALONE.

SHARP'S POINT LANDING,

WICOMICO COUNTY, November 28th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

DEAR SIR:—I have lived on the Wicomico river for fifty years, and have been engaged in hauling a seine at my landing for thirty years. Ten or twelve years ago shad and herring commence to decrease and continued to do so until about four years ago when they commenced to increase both in size and quantity, and last year our fishermen were happy, for they received good prices for them just on the account of their being so large. We all attribute it to fish hatching, and hope you will continue the good work.

LITTLETON SMITH.

I have lived on the Wicomico river for a long time, and there were more shad caught in our river last year than there has been for several years before, and they were the largest I ever saw. I attribute it to fish hatching.

J. W. DAYLEY.

CHOPTANK FISHERIES, June 6th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing for twenty-five years. In the last five years shad and herring have increased in the Choptank river. I cannot say the cause of the increase.

Yours truly,

ELIJAH S. SPENCE.

CHOPTANK RIVER, June 6th, 1889.

Mr. Toadvine, Fish Commissioner:

I have lived on the Choptank river and been a fisherman on the river for twenty-five years. Shad and herring have increased for the last five or six years. I know of no cause of the increase but artificial hatching and the placing in our waters by the Maryland Fish Commission of millions of young fish.

Yours truly,

ISAIAH CHRISTOPHER.

COLLIN'S WHARF,

WICOMICO COUNTY, November 21st, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

DEAR SIR:—I thought I would drop you a few lines in regards to fish hatching and the eel bill. If fish hatching is any advantage it has showed for itself in the last two or three years—the last spring more so, for there was more shad and herring in the Wicomico river last

spring than has been for twelve or fifteen years, but I think it would be a good idea if you would appropriate more money for the propagation of rock and perch, which stay with us all the year, and if we could get our river stocked with them they would increase as well as the shad have done.

There is some German carp in our river; I caught some this year. As for the eel bill, I don't think much of it for one reason, while the State is spending thousands of dollars to break the eels up, it is robbing the market of a great sum by breaking them up, which is impossible to do, for it would take all the fishermen in the United States as many years as there are days in a year, to break up the eels in the Wicomico river, and then would not do it. All hard scale fish destroy spawn, such as rock, perch of all kinds, pike and cat fish. The eels are good enough where they are, so let them rest.

Yours respectfully,

C. B. SMITH.

SHARPTOWN, November 27th, 1889.

S. P. Toadrine, Fish Commissioner of Maryland,

MY DEAR SIR:—I have spent a great part of my life on the water of the Nanticoke river and engaged in spring fishing for shad and herring. I have noticed for the last few years a general increase in quantity and quality, and I credit it to the operations of your force on this and other rivers, hatching fish. I have seen your men turn the little fellows out by the millions, and I am thoroughly convinced were it not for the help the Fish Commission affords us, the fishing on the Nanticoke river would soon become a very unprofitable business. This is the opinion of the fishermen on this river, and they join me in saying that we heartily recommend the Fish Commission, and wish your appropriation from the State was enough to justify you in doubling your force and thereby stock us with fish.

Yours truly,

J. M. SMITH.

VIENNA, November 19th, 1889.

To the Fish Commissioners of the State of Maryland,

GENTLEMEN:—I have been engaged in fishing on the Nanticoke for eight or ten years, and in the last three or four years it has been very apparent that fish generally were of finer size and more numerous, especially so with shad and herring. This year fish were more plentiful than I have seen for many years, and I feel confident that such a decided improvement in the supply and size of fish is due to the successful hatching and placing in our river such large quantities of young fish by the Fish Commissioner. Hoping that the State will continue the commission,

I am yours truly,

J. C. D. ADAMS.

NORTH EAST, November 26th, 1889.

To the Fish Commissioners of Maryland,

GENTS:—I have been engaged in fishing in different ways on the North East river for about thirty years. I know, beyond a doubt, that in the last five years there has been a wonderful increase of herring, and we are catching new fish in our waters such as German carp and bass. I am satisfied that in the last four or five years there has been a large increase of shad. I attribute the increase to the Fish Commissioners, and I believe, and know they are doing good.

WM. HARNEY.

SECRETARY CREEK, June 29th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing on the Choptank river fifteen years, and I have found that shad and herring have increased largely for the last six years. I attribute the increase to artificial hatching. I think if the State were to stop the hatching, we would in a short time not have any fish, as there are now twice as many traps as there were six years ago.

Yours truly,

J. R. CULBOURN,

CAMBRIDGE, June 4th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing in Choptank river about twelve years, and fish have increased in the last six. I think the increase can be attributed to the fish deposited in the river.

Yours, &c.,

J. W. JAMES.

NORTH EAST, Nov. 25th, 1889.

To the Fish Commissioners of the State of Maryland:

GENTS:—I have been engaged in fishing on the Potomac and North East rivers for fifty years. By close observation, I believe, and I am convinced, that there has been an increase of shad in the last four or five years; I also know that the shad are larger and finer in every respect. I attribute this increase and improvement to the Fish Commission. I believe they are doing a great work in stocking our rivers, for the shad that was caught ten, twenty or twenty-five years ago, were no comparison in size to what we are catching now, or the past five years. It is a common thing to catch shad weighing six, seven and eight pounds.

Yours truly,

ELI BURROUGHS.

VIENNA, Nov. 20th, 1889.

To the Fish Commissioners of Maryland:

GENTLEMEN:—I have been engaged in fishing and dealing in fish at this place for several years, and for the last three years there has been a steady increase in number and size of fish, shad and herring in particular, and this year the fishings were the best of all, and I must say, that I attribute the increase to the energy of the Maryland Fish Commission, who have hatched and placed large numbers of fish in our river. I hope the State will continue the Commission, as it is a great benefit to our fishermen.

Yours respectfully,

PEYTON B. HODSON.

TRAPPE, TALBOT COUNTY, June 8th, 1889.

To S. P. Toadvine, Esq., Fish Commissioner,

DEAR SIR:—I commenced to fish in the Spring of 1881, and we did not catch shad enough to pay expenses, and in fact it was a general failure all along the river, but the next season was a fairly good one to the best of my recollection, but then followed one or two very poor seasons, so you see there was no certainty attached to the fishing.

During that time I removed to Baltimore for two years, and was not engaged in fishing, but for the last four or five years there has been plenty of fish, shad in particular. I attribute it to the Fish Commission entirely, believing fully had there been no artificial fish hatching, we would not be able to catch what we could consume in

our own families, that is saying a great deal, but I think it would have been a true bill, and I am fully aware that for the last five years the fish have increased ten to one in former years, and the increase of traps and fishermen is likewise. The increase gave all as many fish as they could handle conveniently.

Yours respectfully,

OLIVER C. HENRY.

TUCKAHOE CREEK, May 4th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been a dealer in shad on Tuckahoe river for the last fifteen years, and can say that there has been a great increase of shad for the last five years. In my opinion shad hatching has been the cause of the increase.

Yours truly,

GEO. E. FORD.

TRAPPE P. O., May 24th, '89.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing in the Choptank river off an on for forty-five years, and I think there has been an increase in catch of shad and herring. Why I say so is, we catch as many fish as we did forty years ago and there is twenty times as many after the fish. I must attribute the increase of the fish to artificial hatching.

Truly yours,

T. T. SEYMORE.

HEARN'S WHARF, Near Upper Ferry, Nov. 28th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

MY DEAR SIR:—I and my son catch as many fish on the Wicomico river as any other fisherman. This year we are pleased to report and say that we found shad and herring larger in size and greater in number than we have had for several years. I hope you may continue to improve our fish, for if the good work of the Commission is continued, I am sure our fish will continue to increase as they have done in the past.

Yours respectfully,

MATT. MARSHALL.

TUCKAHOE CREEK, May 24th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing for ten years, and for the last four years the shad have been more plentiful than before, and I think it is from the shad hatched on the river. The hatching process is doing much for the fisherman.

Truly yours,

SAM'L DULING.

TUCKAHOE CREEK, May 24th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing thirty-five years, and I think there has been more increase of fish in the last ten years, and there seems a greater increase every year. Fish hatching is the cause of it, in my opinion. I want it to continue. I think it one of the best laws that has been made, and in fact, I know it, for if the eggs were not hatched they would be a total loss to the fishermen. Let the good work go on.

Yours respectfully,

DAVID WOOTERS.

TUCKAHOE CREEK, May 24th, 1889.

Mr. Toadvine, Fish Commissioner :

DEAR SIR:—Fish hatching has been a great benefit, and in my opinion, I think it will continue to be.

Truly,

G. W. COLLISON.

SHARPS' POINT, WICOMICO COUNTY, November 28th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

MY DEAR SIR:—I take the opportunity to inform you what I think of artificial fish hatching. I have lived on the Wicomico river for over thirty years, and I think that it is one of the best things in existence, for if it had never been commenced we would not have a shad in our river by this time, for they had dwindled down to almost nothing before fish hatching was commenced, now our fish are increasing. I hope you may continue to hatch fish until our river is full of them, for I know it is a good work.

Yours respectfully,

BENJ. JONES.

VIENNA, November 19th, 1889.

To the Fish Commissioners of Maryland,

GENTLEMEN :—I have been engaged in fishing and dealing in fish in this place for four years; in the Nanticoke river for over twelve years, and there has been a great and steady increase in number and size of fish, especially shad and herring; this year the fishings were the best of all. I attribute this increase to the labors of the Maryland Fish Commission, and hope the State will continue the said commission.

Very truly yours,

CAPT. HOUSTON W. HINLEY & SON.

NANTICOKE RIVER. November 20th, 1889.

To the Fish Commissioners of Maryland,

GENTLEMEN :—I have been engaged in the haul seine business on the Nanticoke river for quite a number of years, and I have observed that we get shad earlier, of a finer quality and more abundant since the Fish Commission has been operating on our river, and I can fully recommend it as a paying investment to the State of Maryland.

Yours truly,

E. J. ELLIS.

FOULING CREEK, June 17th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been engaged in fishing on Choptank river for twenty years and find the catch of fish has increased in the last six years, the cause of which I attribute to the Maryland State Commission.

Yours truly,

ANDREW TOWERS.

BOLINGBROKE, June 22d, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing for twenty-five years and the catch has decidedly increased for the last six years. In my judgment it is attributed to the hatching process alone, and it would be a decided advantage to the public if you could propagate more. I am greatly in favor of the State propagation.

Yours respectfully,

S. J. GRIFFIN.

NANTICOKE RIVER, November 20th, 1889.

To the Fish Commissioners of Maryland,

MY DEAR SIR:—I began fishing on the Nanticoke river when a very small boy with float seines, and for thirty-three years have followed the business each spring, principally for shad, and I find for the last ten or twelve years we get shad earlier and more abundant, and I attribute the increase solely to the efforts of the Fish Commission.

Yours truly,

JOHN WALKER.

BROOKVIEW, DORCHESTER COUNTY, November 20th, 1889.

To the Fish Commissioners of Maryland,

GENTLEMEN:—I have been a fisherman with float seine for a long time and have been a close observer of the run of fish, and find for the last few years the run has been more plentiful, finer in quality and earlier in spring since the Fish Commission has been in operation on our river (Marsh Hope,) and can fully recommend it.

Yours truly,

GEORGE W. MARINE.

CAMBRIDGE, June 5th, 1889.

S. P. Toadvine, Esq., Fish Commissioner.

DEAR SIR:—I have fished on the Choptank river for seventeen years, there has been a large increase of fish for the last five years, shad in particular. I attribute said increase to artificial hatching.

Yours respectfully,

JOHN PAGE.

TRAPPE, Talbot County, May 30th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been a fisherman for six years. Shad has increased in the Choptank every year for the last six years, and I attribute the increase to fish hatching on our river by the Maryland Fish Commission, who have turned out millions of young shad every year in the river.

Yours respectfully,

GEO. WHITTEN.

CHOPTANK RIVER, Near Cambridge, May 30th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

DEAR SIR:—I have been living on the Choptank river for fifteen years, and have been engaged in fishing, and during that time I have noticed an increase of fish every year for the last six years; I attribute the increase to artificial hatching. I am in favor of it for I think it is doing a great good to our fisheries. We find new fish in our river such as German Carp, and I like them very much, and in a short time I think the carp will be a great benefit to our food fish. I think your appropriation ought to be doubled.

Yours truly,

A. L. DUNHAM.

TUCKAHOE CREEK, May 24th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been engaged in fishing on Tuckahoe Creek for twenty years. For the last five or six years the fishing has improved, and for the last three years there has been more shad caught every year. I think the hatcheries on the river the cause of the increase.

Yours respectfully,

THOMAS W. PARROT.

TUCKAHOE CREEK, May 24th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing for fourteen years. There has been an annual increase every year for the last four or five years. I think the placing of young shad in the river by the State Fish Commission is the cause of the increase.

Yours respectfully,

ROBERT G. PARKER.

NORTH EAST, Nov. 21st, 1889.

To the Fish Commissioners of the State of Maryland,

GENTLEMEN :—We, the undersigned, have been engaged in fishing in the North East river, and can testify there has been a large increase of shad and herring for the last five years, and in view of the large quantity of contrivances that has been brought into use and the increased number of men, boats and capital employed on the Cheapeake Bay and its tributaries from the Capes to the head of tide-water. We in taking this view, know there has been an increase of shad in our waters during the past four or five years. We attribute the increase to the large quantity of young fish placed annually in our waters by the State Fish Commissioners.

We, the undersigned, would like to see it continued, believing that it will assist largely in building up the fisheries in this section and will be a benefit to the people.

JAMES VEASEY, Giller, 20 years.
WILSON, LYNCH, Giller, 30 years.
W. J. McDOWELL, Giller, 20 years.
CHAS. PIERCE, Haul Seine, 20 years.
JOS. MURPHY, Giller 35 years.
ELIHU LYNCH, Giller, 35 years.
ROBERT JOHNSON, Giller, 13 years.
W. H. ABRAHAMS, Giller, 23 years.
THEODORE JACKSON, Giller, 10 years.
GEO. W. BARNES, Haul Seine, 20 years.
E. C. YEAMAN, Giller, 30 years.

TRAPPE, P. O., May 14th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR :—I have been fishing on the Choptank river for the last thirty years : and for the last three years fish have been more plentiful than I ever knew them since I began fishing. I think it is caused by the fish hatching.

Yours truly,

JAMES T. WHIBY.

TRAPPE P. O., May 2nd, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR :—I have been fishing in Choptank river for five years, and this spring the shad have been a great deal better in size and number than when I commenced fishing. Cannot say the cause of the increase.

Yours respectfully,

WM. H. HARDING, JR.

TRAPPE P. O., May 2nd, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR :—I have been fishing in Choptank river for the last eight years, and there has been an increase of shad every year.

Yours respect.,

WM. ALLEN.

TRAPPE P. O., May 14th, 1889.

Mr. Toudvine, Fish Commissioner,

DEAR SIR:—I have been fishing in the Choptank river for twenty-five years. I find there has been more fish in the last two years than was for twenty years back, and the catch greater. Yet there are ten times as many traps as was twenty years ago. I attribute the increase to artificial hatching.

Respectfully,

JOHN J. HURST.

EAST NEW MARKET, May 4th, 1889.

Mr. Toudvine, Fish Commissioner,

DEAR SIR:—I have been engaged in fishing on Choptank river for fifteen years, and I think there has been a great increase of fish, in fact I know so. I think from fish hatching, shad and herring are getting more plentiful all the time.

Truly yours,

CAPT. JOHN H. MARSHALL.

UPPER FERRY, WICOMICO RIVER.

S. P. Toudvine Fish Commissioner,

DEAR SIR:—Being a fisherman on the Wicomico river for a number of years, I am pleased to inform you that I made more money catching shad last year than any one year before; I consider that it was due to fish hatching, for the fish were larger and more of them last year than for a great many years before. I hope you will continue to hatch fish for many years to come.

Yours truly,

SAML. HOPKINS.

UPPER FERRY, WICOMICO RIVER.

S. P. Toudvine, Fish Commissioner,

DEAR SIR:—I have been fishing for several years on the Wicomico river, and have watched with great interest the effects of fish hatching. I am pleased to state that I consider it a great success; our fish has increased wonderfully in number and size. I hope you may still carry on the good work, and I will do all in my power to help you.

Yours respectfully,

J. W. LAWRENCE.

SHARPTOWN, Nov. 25th, 1889.

S. P. Toudvine, Esq., Fish Commissioner of Maryland,

MY DEAR SIR:—I have been engaged for a long time fishing on the Nanticoke river for shad and herring, and for the last few years have caught more fish than ever before, earlier and of a finer quality; and as there are at least five to one fishermen engaged now than there was ten years ago, I can attribute it only to the industrious operations of the Fish Commission. May the good work go on.

Yours truly,

HENRY MARINE.

COLLIN'S WHARF, WICOMICO COUNTY, Nov. 28th, 1889.

Mr. Toudvine, Fish Commissioner,

DEAR SIR:—I thought I would drop you a few lines concerning your hatching of fish. If you were to devote more of your time to the hatching of perch and rock, I think it would be of more value to the people on the Wicomico river and creeks. It has made a big difference in your hatching of shad on this river. I know there were more

shad caught last spring then for several years before. If you will hatch more rock and perch, I am sure they would increase as the shad have done. Hope you will give it a test.

Yours Respectfully,

WILLIAM P. INSLEY.

TRAPPE P. O., May 12th, 1889.

Mr. Toadrine, Fish Commissioner,

DEAR SIR:—I have been fishing in the Choptank river for four Springs, and find this and last Spring there has been a decided increase of shad and herring and much better in size. I cannot say the cause.

Truly,

EDWARD STONE.

TRAPPE P. O., May 24th, 1889.

Mr. Toadrine, Fish Commissioner,

DEAR SIR:—I have been fishing off and on in the Choptank river for twenty years, and there is no doubt there has been a great increase of shad and herring every year in the last six years. It is attributed to the fish hatching and putting them in our river.

Respectfully,

THOS. V. HUGHLETT.

CHOPTANK FISHERIES, May 30th, 1889.

Mr. Toadrine, Fish Commissioner,

DEAR SIR:—I have been fishing on the Choptank river for thirty-five years. There has been a large increase of fish in the last six years, shad in particular. I think artificial fish hatching the cause of the increase, as there are thousands of dollars invested in fishing now, where there was not over one hundred ten years ago, and we catch more fish now than was caught ten years ago.

Yours truly,

WM. H. DENNIS.

CHOPTANK FISHERIES, May 30th, 1889.

S. P. Toadrine, Esq., Fish Commissioner,

DEAR SIR:—I have been fishing on the Choptank river for seventeen years; for the last four or five years there has been a large increase of shad. I attribute the increase to artificial fish hatching.

Yours truly,

W. F. REAGEN.

ANDERSONTOWN, June 25th, 1889.

Mr. Toadrine, Fish Commissioner,

DEAR SIR:—I have been for twenty-five years fishing in the Choptank river, fish has increased, shad in particular, up the river, over one half for the last few years. I believe artificial hatching the cause of the increase.

Yours respectfully,

H. H. STORES.

FOWLING CREEK, July 2nd, 1889.

Mr. Toadrine, Fish Commissioner,

DEAR SIR:—I have been engaged in fishing on the Choptank river about eight years, and the catch of the fish has increased for the last five years, shad and herring. I attribute the increase to State

hatcheries and nothing else; shad and herring have been more plentiful the last spring than ever before since my recollection. I think the State Fish Commission a good thing.

Yours truly,
G. L. BUTLER.

HILLSBORO, MD., May 25th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing in Tuckahoe river for sixteen years with haul seine. I think the fishing has been improved by fish hatching, and I hope it will be continued.

Yours truly,
T. B. SPARKLIN.

MIDDLE GROUND, WICOMICO RIVER, November 28th, 1889.

S. P. Toadvine, Fish Commissioner,

MY DEAR SIR:—I have been running fish to market for several years for the fishermen on the Wicomico river, and have also fished considerable myself. I was opposed to fish hatching at first for I thought it was a humbug, but since I have seen the good it has done for our river, I am happy to say that I consider it one of the best things in the State. The fish have improved in size and number, and this year I have carried to Salisbury some of the finest shad that have ever been caught on this river. The fishermen all agree that fish hatching is a success and hope you will continue to stock our river with fish. They say they made more money last season on fish than they have for any one year for a long time.

Yours truly,
WM. H. PHIPPIN.

POTTER'S LANDING, June 6th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have, for twenty-five years, engaged in fishing on the Choptank river, and the catch of fish, shad and herring decreased annually until about five or six years ago. Since that time, there has been an annual increase of shad and herring in our river, and last year was the best of all. I attribute the increase of shad to artificial hatching by the Maryland Fish Commissioners.

Yours truly, &c.,
O. M. HIGNUTT.

TUCKAHOE CREEK, GRIFFIN P. O., May 24th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

I have been engaged in fishing on Tuckahoe creek for four years. There has been an increase of fish every year since I have been fishing. I do not know the cause of the increase.

Yours respectfully,
J. J. CALLOWAY.

SECRETARY CREEK, June 6th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing on the Choptank river for twelve years. Fish has increased for the last six years, shad and herring in particular, but rock and perch very scarce last year. I think hatching of fish the cause of the increase.

Yours respectfully,
WM. COULBOURN.

BETHLEHEM, CAROLINE COUNTY, May 30th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing for the last nineteen years. I have kept a book of what fish I have caught for the last twelve years. I think that shad have been more plentiful for the last five years, and larger. There have been more caught in the Choptank in any one year for the last five or six years than was caught any three years, fifteen years ago.

Yours respectfully,
J. H. CARROLL.

DENTON, CAROLINE COUNTY, May 24th, 1889.

S. P. Toadvine, Fish Commissioner,

DEAR SIR:—I suppose I have been engaged in fishing on the Choptank river off and on for twenty-five years, and there has been a marked increase in fish for the last five or six years, shad and herring in particular. I believe artificial fish hatching the cause of the increase. I am in favor of its continuance, and if it is not continued the fishing will soon be broken up in our river.

Yours Respectfully,
NATHANIEL PHILLIPS.

DENTON, CAROLINE COUNTY, May 25th, 1889.

Mr. S. P. Toadvine Fish Commissioner,

DEAR SIR:—I have been in Caroline county twenty-three years, and will say that shad have been finer and more plentiful for the last three years. I attribute the cause of the increase of fish to the artificial hatching and the industry of the Fish Commissioner.

Yours truly,
JOHN R. GRIFFIN.

DENTON, CAROLINE COUNTY, May 25th, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing on the Choptank river near Denton for twenty-five years. Since the appropriation by the legislature for the propagation of fish the quality and quantity has increased every year, shad and herring in particular. I attribute the increase to the millions of young fish placed in our river by the Maryland Fish Commissioner.

Yours truly,
HENRY IRWIN.

CHOPTANK RIVER, June 2nd, 1889.

Mr. S. P. Toadvine, Fish Commissioner,

DEAR SIR:—I have been fishing on the Choptank river for eight years; there has been an increase of fish every year for the last six years. I think artificial hatching and placing the young fish in our river the cause of the increase.

Yours truly,
JOHN W. DUNN.

TUCKAHOE CREEK, May 24th, 1889.

Mr. Toadvine, Fish Commissioner,

DEAR SIR:—I have been engaged in fishing on Tuckahoe creek for fifteen years. At that time shad was very scarce and continued so for several years. For the last three years there has been a great increase

in shad, and I am sure that the increase is from the millions of young shad hatched and turned out in our river by the Maryland Fish Commissioners.

Yours truly,

C. D. CALLOWAY.

DENTON, CAROLINE COUNTY, MD., May 24th, 1889.

S. P. Toudvine, Fish Commissioner,

DEAR SIR:—I have been fishing for six years in the Choptank river, and there has been an increase every year since I commenced fishing. I think artificial fish hatching the cause of the increase.

Yours, &c.,

JOHN M. MASSEY.

TRAPPE DISTRICT, TALBOT COUNTY,

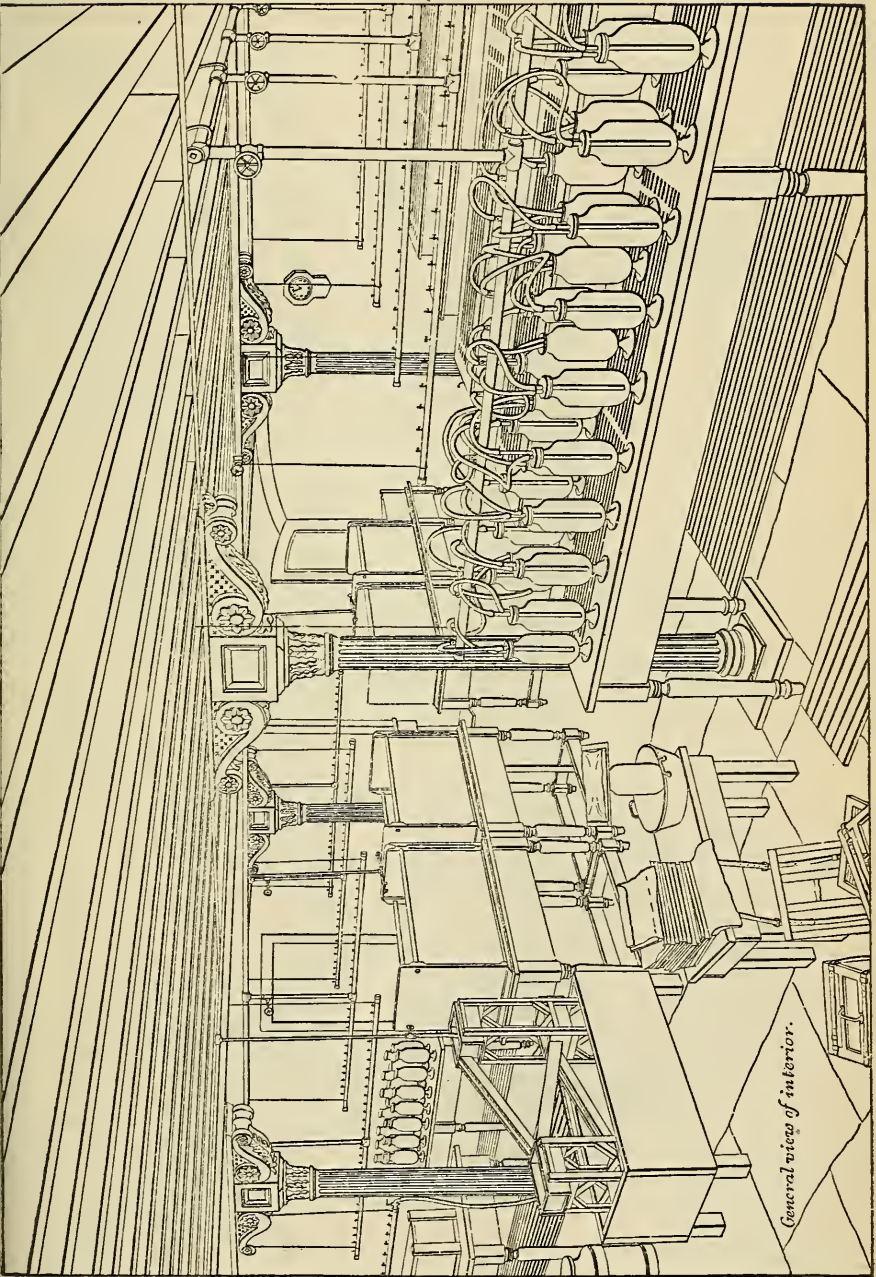
Brambury Neck, May 29th, 1889.

Mr. S. P. Toudvine, Fish Commissioner,

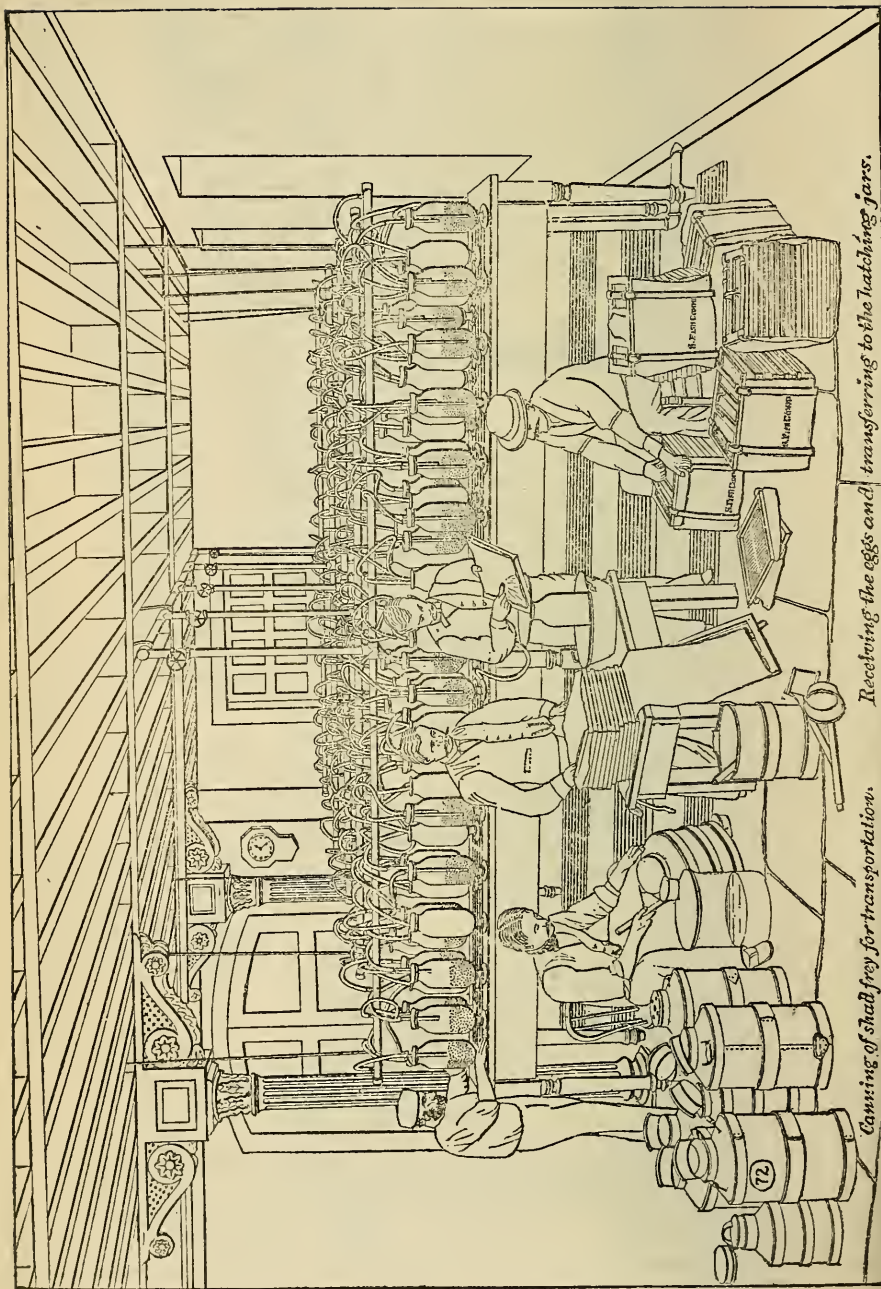
DEAR SIR:—We, the undersigned, fishermen living in the vicinity of Brambury Neck, Trappe District, Talbot county, Maryland, and engaged in fishing on the Choptank river. We are aware of the fact, that there has been a marked increase of the run of shad for the last several years, and we believe that such increase is due the Maryland Fish Commission, who have turned out large quantities of young fish in our river.

Yours truly,

JOSEPH C. EWING,
ASA COCKEY,
GEORGE MILLS, Sr.,
HENRY F. HUMMES,
ROBERT F. BRYAN,
J. T. McKUETT,
WM. REDDIE,
F. F. COX,
SAMUEL TOWNSEND,
WM. T. LEWIS,
HUGH KEMP.

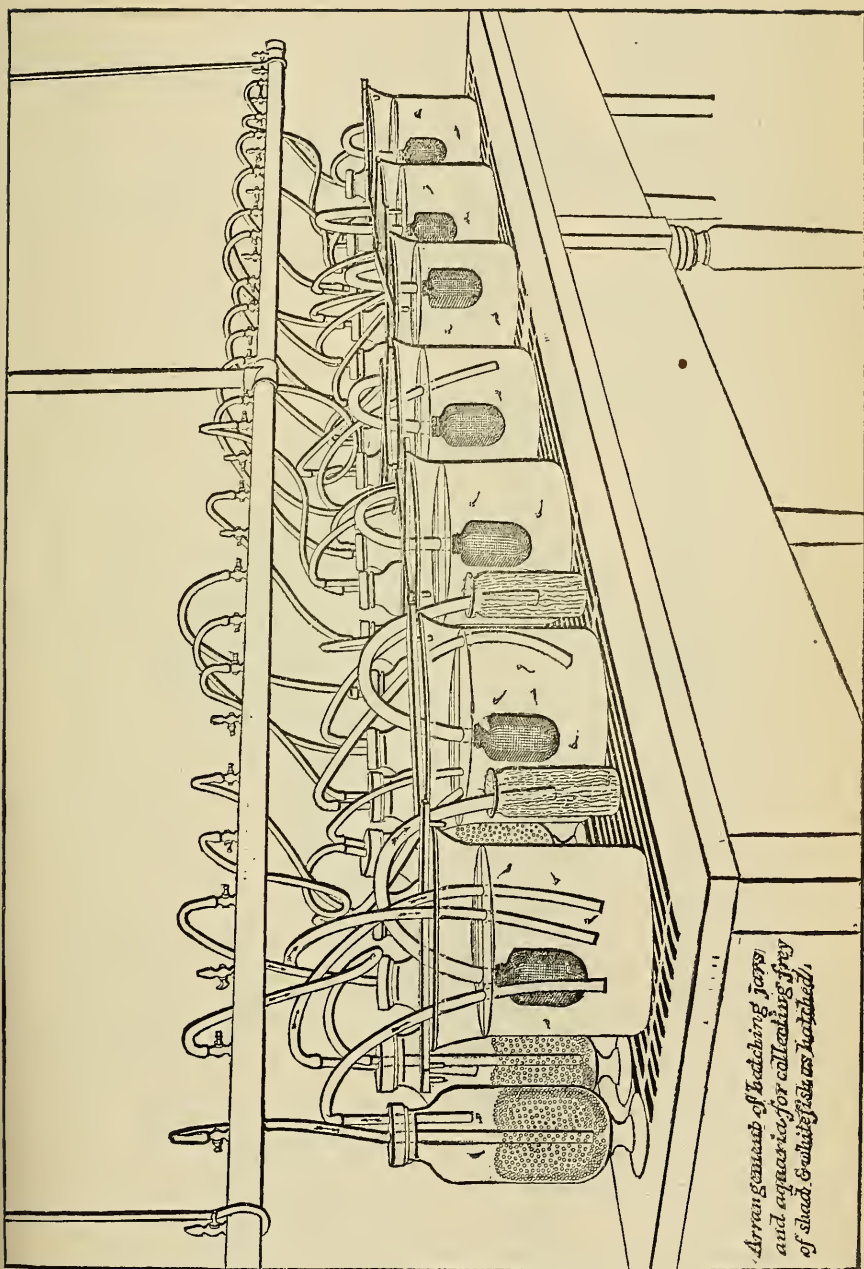


General view of interior.

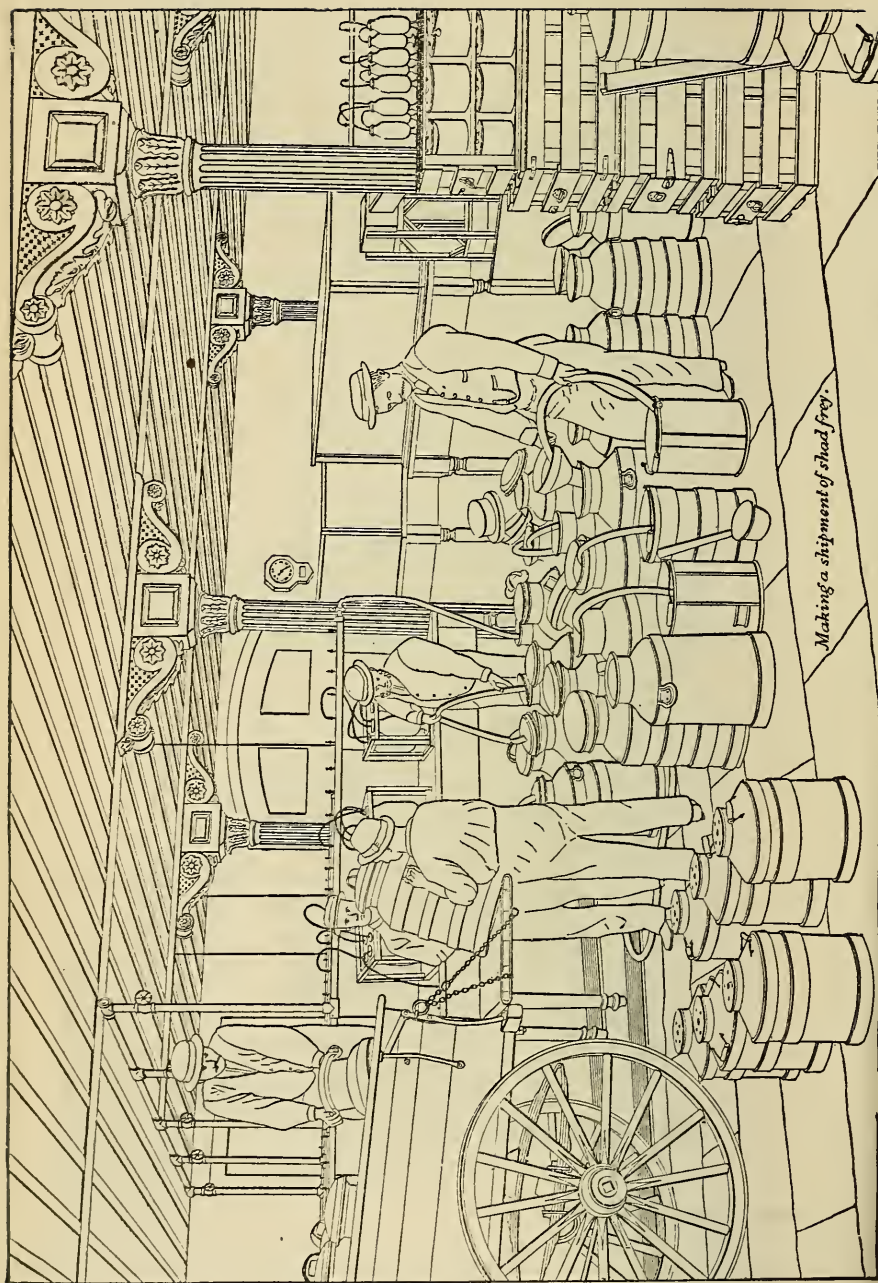


Canning of shad fry for transportation.

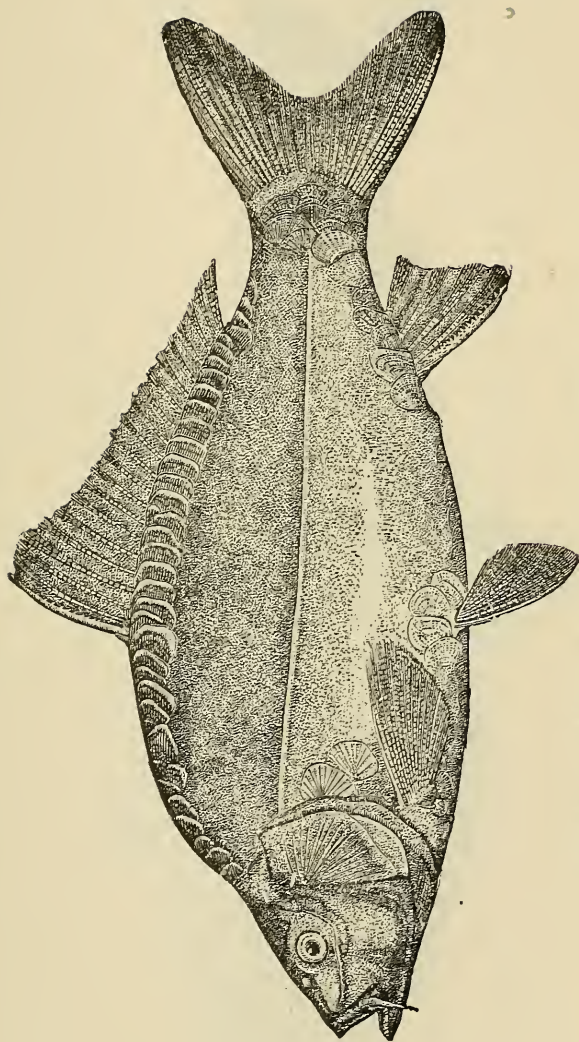
Receiving the eggs and transferring to the hatching jars.



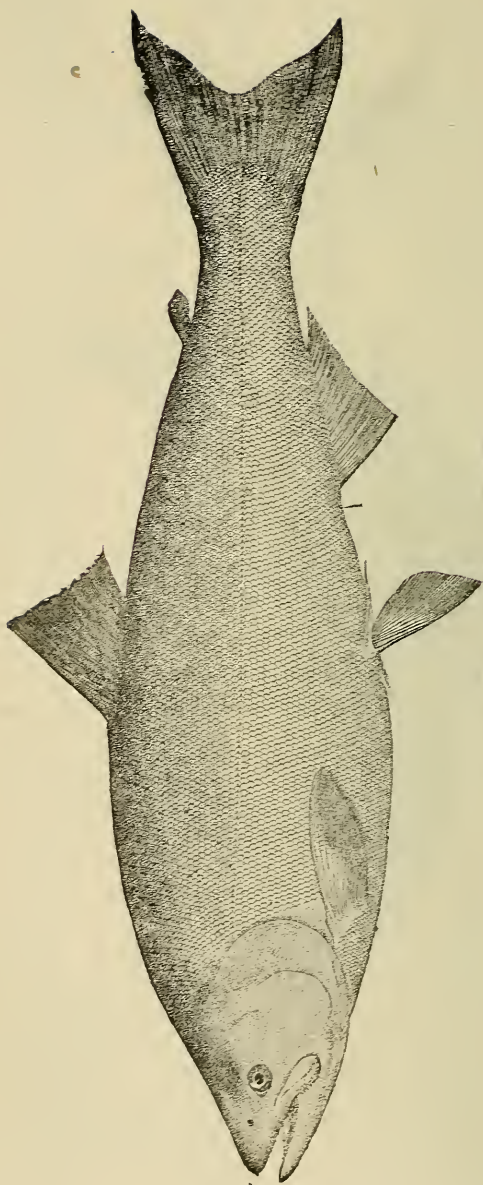
*Arrangement of hatching jars
and aquaria for collecting fry
of shad. Gulletfishes as hatched.*



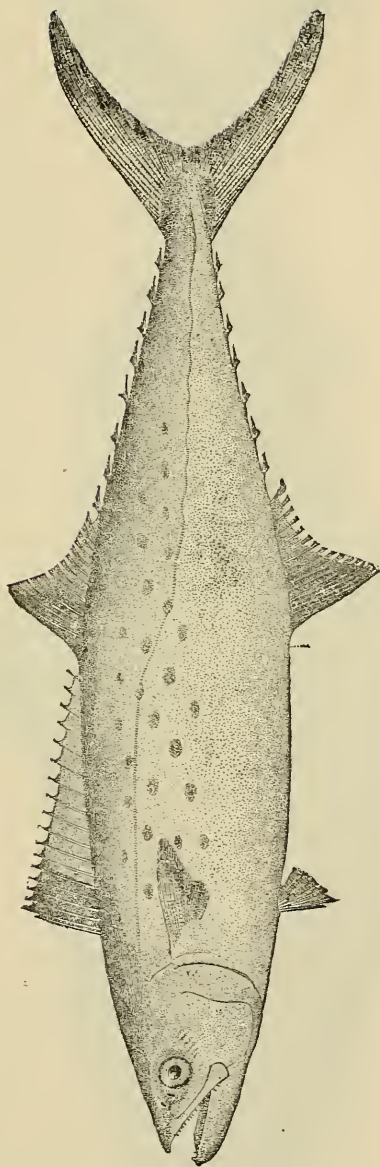
Making a shipment of shad fish.



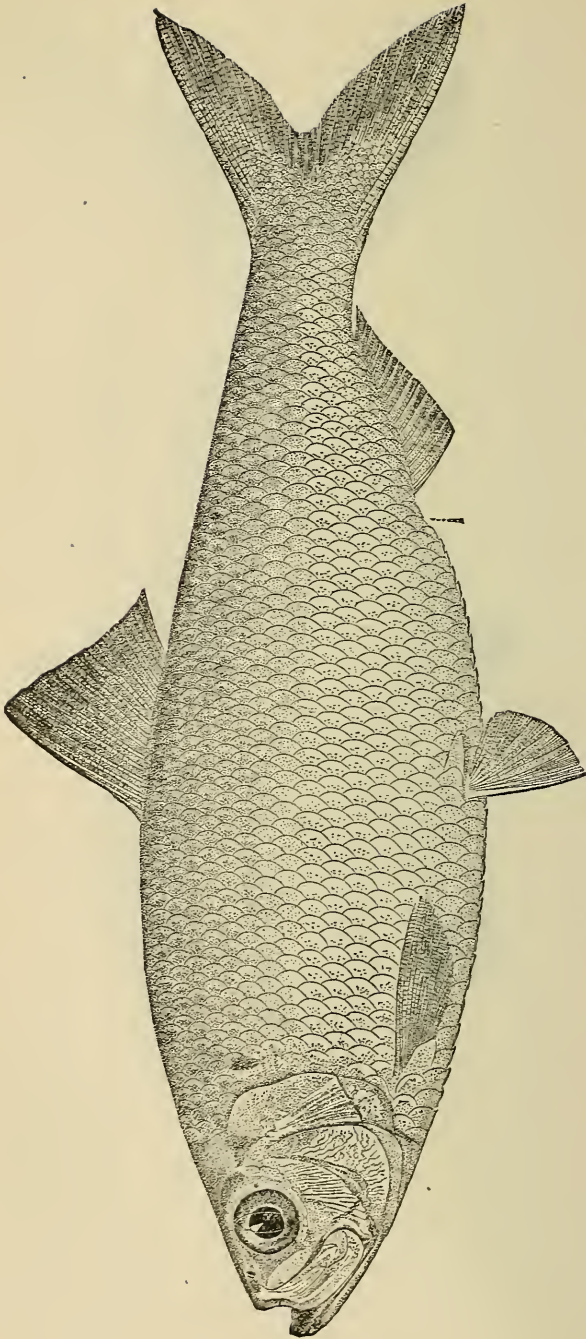
GERMAN (MIRROR) CARP (one-eighth natural size.)



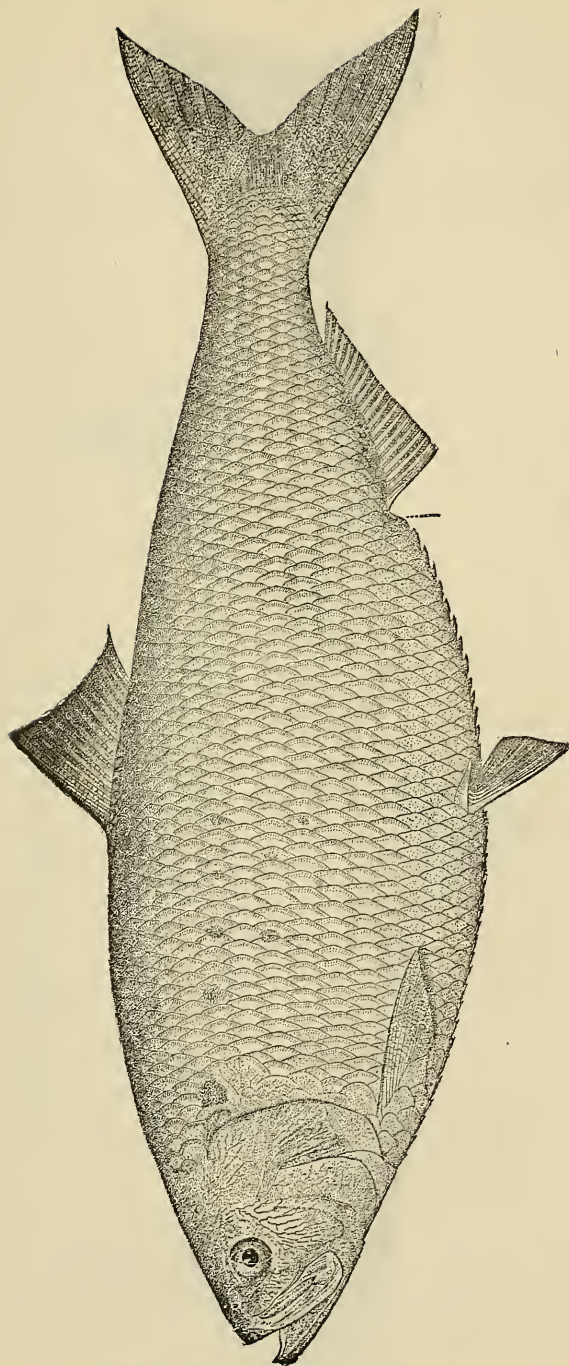
LAND-LOCKED SALMON.



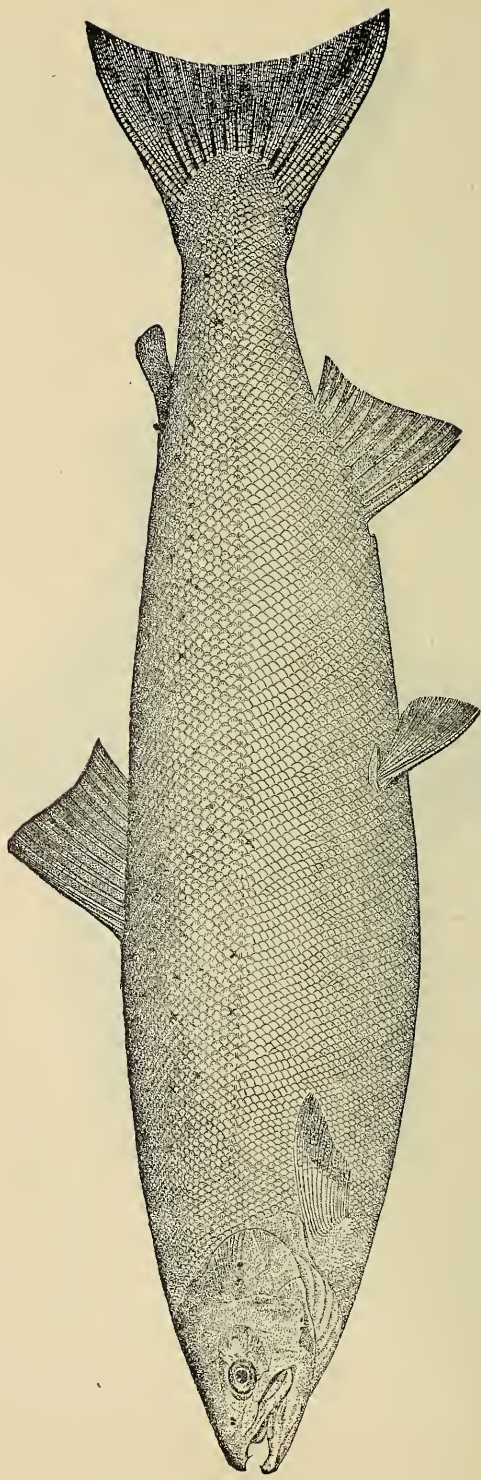
SPANISH MACKEREL (one-quarter natural size.)



SHAD, MALE (one-quarter natural size.)



SHAD, FEMALE, (one-quarter natural size.)



COLUMBIA RIVER SALMON, (one-sixth natural size.)

LIST OF FISH COMMISSIONERS.

The United States—

Col. M. McDonald, D. C.

Alabama—

Col. D. R. Hundley, Madison.

Hon. Charles S. G. Doster, Prattville.

Arizona—

J. J. Goster, P. O. address, Los Angeles, Cal.

Richard Rule, Yuma.

J. H. Taggart, Business Manager.

Arkansas—

H. H. Rottaken, President, Little Rock.

J. W. Calloway, Little Rock.

W. B. Worthen, Little Rock.

California—

Joseph Routier, President, Sacramento.

Thos. J. Sherwood, Secretary, Marysville.

J. Downie Harvey, Los Angeles.

Dominion of Canada—

John Tilton, Deputy Minister of Fisheries, Ottawa, Ont.

Province of New Brunswick—

W. H. Venning, Inspector of Fisheries, St. John.

Province of Nova Scotia—

W. H. Rogers, Inspector, Amherst.

A. C. Bertram, Assistant Inspector, North Sydney.

Province of Prince Edward Island—

J. H. Duvar, Inspector, Alberton.

Province of Quebec—

W. Wakeham, Inspector Lower St. Lawrence and Gulf Division,
Gaspé Basin.

Province of British Columbia—

Thos. Mowat, Inspector, New Westminster.

Province of Manitoba and Northwest Territories—

Alex. McQueen, Inspector, Winnipeg, Man.

(S. Wilmot, Superintendent of Fish culture, New Castle, Ont.)

Colorado—

John Pierce, Denver.

Connecticut—

Wm. M. Hudson, Hartford.

Robert G. Pike, Middletown.

James A. Bill, Lyme.

Delaware—

Elwood R. Norny, Odessa.
 Dr. E. G. Shortlidge, Assistant and Superintendent of Hatcheries,
 Wilmington.

Georgia—

Hon. John T. Henderson, Commissioner of Agriculture, Atlanta.
 Dr. H. H. Cary, Supt. of Fisheries, LaGrange.
 (Under the laws of the State these constitute the Board of Fish
 Commissioners.)

Illinois—

N. K. Fairbank, President, Chicago.
 S. P. Bartlett, Secretary, Quincy.
 Maj. G. Breuning, Centralia.

Indiana—

Enos B. Reed, Indianapolis (Term expires in 1887).

Iowa—

E. D. Carlton, Spirit Lake.

Kansas—

S. Fee, Wamego, Pottawatomie county.

Kentucky—

Wm. Griffith, President, Louisville.
 P. H. Darby, Princeton.
 John B. Walker, Madisonville.
 Hon. C. J. Walton, Mumfordsville.
 Hon. John A. Steele, Midway.
 W. C. Price, Danville.
 Hon. J. M. Chambers, Independence.
 A. H. Goble, Catlettsburg.
 J. H. Mallory, Bowling Green.

Maine—

E. M. Stillwell, Bangor.
 Henry O. Stanley, Dixfield.
 B. W. Counce, Thomastown, Sea and Shore Fisheries.

Maryland—

S. P. Toadvine, Salisbury.
 G. W. Delawder, Oakland.

Massachusetts—

F. A. Brackett, Winchester.
 F. W. Putnam, Cambridge.
 E. H. Lathrop, Springfield.

Michigan—

John H. Bissell, Detroit, President.
 Herschel Witaker, Detroit.
 Dr. J. C. Parker, Grand Rapids.
 (Secretary, A. J. Kellogg, Detroit).
 (Superintendent, Walter D. Marks, Paris).

Minnesota—

3d District—Dr. Robert Ormsby Sweeny, President, St. Paul.
 2d District—Niles Carpenter, Rushford.
 1st District—William Bird, Fairmount.
 (Superintendent, S. S. Watkins, Willow Brook, St. Paul).

Missouri—

H. M. Garlich, Chairman, St. Joseph.
 J. L. Smith, Jefferson City.
 H. C. West, St. Louis.
 A. P. Campbell, Secretary, St. Joseph.
 (Superintendents: Philip Kopplin, Jr., St. Louis; Elias Cottrill, St. Joseph).

Nebraska—

William L. May, Fremont.
 Dr. Robert R. Livingston, Plattsmouth.
 B. E. B. Kennedy, Omaha.
 (Superintendent, M. E. O'Brien, South Bend.)

Nevada—

W. M. Cary, Carson City.

New Hampshire—

George W. Riddle, Manchester.
 Elliott B. Hodge, Plymouth.
 John B. Kimball, Marlborough.
 (Superintendent, E. B. Hodge, Plymouth.)

New Jersey—

Richard S. Jenkins, Camden.
 William Wright, Newark.
 F. M. Ward, Newton.

New York—

Hon. R. B. Roosevelt, President, New York.
 Gen. R. U. Sherman, New Harford.
 E. G. Blackford, Fulton Market, New York.
 Wm. H. Bowman, Rochester.
 A. S. Joline, Tottenville.
 E. G. Blackford, Shellfish Commissioner.
 (Superintendents: Seth Green, Rochester; Fred. Mather, Cold Spring Harbor; Monroe A. Green, Mumford; James A. Marks, Bloomingdale. Secretary, H. H. Thompson, Brooklyn; Clerk of Shellfish Commission, E. P. Doyle, Tompkinsville).

Ohio—

Hon. C. V. Osborn, President, Dayton. (Term expires 1891).
 John Hofer, Bellaire. (Term expires 1890).
 H. P. Ingalls, Huntsville. (Term expires 1889).
 A. C. Williams, Secretary, Chagrin Falls. (Term expires 1888).
 E. D. Potter, Toledo. (Term expires —).

Pennsylvania—

Henry C. Ford, President, 524 Walnut street, Philadelphia.
 James V. Long, 205 Ridge avenue, Alleghany City.
 H. C. Demuth, Secretary, Lancaster.
 S. B. Stilwell, Scranton.
 A. S. Dickson, Meadville.
 W. L. Powell, Harrisburg.

Rhode Island—

John H. Barden, Rockland.
 Wm. P. Morton, Providence.
 Henry T. Root, Providence.

(These Commissioners are appointed for three years by the Governor, and receive no compensation except actual expenses).

The following are the Shellfish Commissioners, who are elected by the Legislature and receive pay for their services :

James C. Collins, North Providence.

N. P. S. Thomas, North Kingstown.

James M. Wright, Foster.

South Carolina—

Hon. A. P. Butler, Columbia.

Tennessee—

W. W. McDowell, Memphis.

H. H. Sneed, Chattanooga.

Edward D. Hicks, Nashville.

Vermont—

Hon. Herbert Brainerd, St. Albans.

F. H. Atherton, Waterbury.

Virginia—

Col. Marshall McDonald, Berryville.

Washington Territory—

Albert T. Stream, North Cove, Pacific county.

West Virginia—

C. S. White, President, Romney.

F. J. Baxter, Treasurer, Sutton.

James H. Miller, Secretary, Hinton.

Wisconsin—

The Governor, *ex-officio*.

Philo Dunning, President, Madison.

C. L. Valentine, Secretary and Treasurer, Janesville.

Mark Douglass, Melrose.

A. V. H. Carpenter, Milwaukee.

Calvert Spensley, Mineral Point.

E. S. Miner, Sturgeon Bay.

(James Nevin, Superintendent, Madison).

Wyoming Territory—

Otto Gramm, Laramie, (Commissioner for the Territory.)

For Carbon county, B. F. Northington, Rawlins.

For Laramie county, Dr. W. N. Hunt, Cheyenne.

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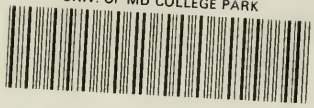
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